1A POLYGON ROAD, LONDON NW1

Noise Impact Assessment

Reference: 13108.RP01.NIA.2
Prepared: 22 December 2023
Revision Number: 2

Origin Housing

Noise Impact Assessment

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Revision	Comment	Date	Prepared By	Approved By
0	Draft Issue of report	12 December 2023	Struan Carmichael	Torben Andersen
1	Report revised to include comments from Client	19 December 2023	Struan Carmichael	Torben Andersen
2	Report revised to include comments from planning consultant	22 December 2023	Struan Carmichael	Torben Andersen

Terms of contract:

The recommendations within this report relate to acoustics performance only and will need to be integrated within the overall design by the lead designer to incorporate all other design disciplines such as fire, structural integrity, setting-out, etc. Similarly, any sketches appended to this report illustrate acoustic principles only and will need to be developed into full working drawings by the lead designer to incorporate all other design disciplines.

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1.0 INTRODUCTION

RBA Acoustics has been appointed to provide a noise impact assessment for the proposed conversion of 1A Polygon Road, an existing office building (Use Class E(g)(i)) to residential accommodation (Use Class C3).

Conversion of existing offices to residential accommodation is permitted under the Town and Country Planning (General Permitted Development) (England) Order 2015 ('the GPDO') without the need for a full planning application process. Notwithstanding this, however, the 2021 amendment to the GPDO requires that, under Schedule 2 (Part 3), Class MA, in order for the change of use of a building falling within Class E (commercial, business and service) of Schedule 2 to a use falling within Class C3 (dwellinghouses) of Schedule 1 to be permitted, the Applicant needs to consider the "impacts of noise from commercial premises on the intended occupiers of the development".

This report seeks to provide a review and assessment of the impacts of noise from commercial premises in the vicinity of the site as well as general commentary on other noise sources.

This report occasionally employs technical acoustic terminology. In order to assist the reader, therefore, a summary of acoustic terms is presented in Appendix A.

2.0 SITE DESCRIPTION

The site is shown in relation to its surroundings in the site plan in Figure 1 (Appendix C).

The site is located in the Euston area of London and is situation in a mainly residential area. The site is occupied by an existing ground plus two storey office building, that fronts Polygon Road to the north-west. Residential properties surrounding the site to the north, east, south and west. Eversholt Street is a major road which is located approximately 25m from the site to the south-west.

The closest commercial properties to the site have been identified to be City Centre Dry Cleaners and the offices of Origin Housing approximately 5m to the south-west of site. Building services noise associated with these commercial premises was noted whilst on site. An image showing the building services is provided in Figure 3 (Appendix C).

Other dominant sources of noise affecting the development site is noted to be general road traffic movements on the nearby and surrounding roads.

3.0 ASSESSMENT METHODOLOGY

3.1 Town and Country Planning (General Permitted Development) (England) Order 2015 (As Amended)

Development) (England) Order 2015 (GPDO) is a statutory instrument, applying in England, that grants planning permission for certain types of development (such development is then referred to as permitted development). Schedule 2 of the GPDO 2015 specifies the classes of development for which prior approval is granted, and specifies the exceptions, limitations, and conditions that apply to some of these classes.

The GPDO 2015 did not require any consideration or assessment of environmental noise impacts on the future residential occupants of commercial office developments.

The 2021 Amendment to this Order, however, came into force on 21st April 2021 and placed an additional requirement allowing the local planning authority to consider noise impacts on the intended occupants of the development from nearby premises in commercial use, as reproduced below:

Conditions

MA.2.—(1) Development under Class MA is permitted subject to the following conditions.

(2) Before beginning development under Class MA, the developer must apply to the local planning authority for a determination as to whether the prior approval of the authority will be required as to—

(a) transport impacts of the development, particularly to ensure safe site access;

(b) contamination risks in relation to the building;

(c) flooding risks in relation to the building;

(d) impacts of noise from commercial premises on the intended occupiers of the development;

Given the above, the purpose of this report is to address the requirements of the 2021 amendment to the Town and Country Planning (General Permitted Development) (England) Order 2015 in relation to the likely impacts of commercial noise upon the future residential occupants of the building. Noise from general environmental sources (e.g. transportation noise) does not require consideration or assessment for this application.

3.2 BS4142:2014 'Method for Rating and Assessing Industrial and Commercial Sound'

BS 4142 is the most appropriate method for assessing industrial and commercial noise emissions affecting residential areas and is also specified by the majority of local authorities for such instances.

The BS 4142 Standard describes methods for rating and assessing the following:

- Sound from industrial and manufacturing processes;
- Sound from fixed installations which comprise mechanical and electrical plant and equipment;
- Sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and
- Sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train movements on or around an industrial and/or commercial site.

The methods use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

If appropriate, the specific sound level of the source ($L_{Aeq,T}$) is corrected, by the application of one or more corrections for acoustic features such as tonal qualities and/or distinct impulses, to give a 'rating' level ($L_{Ar,Tr}$).The Standard effectively compares and rates the difference between the rating level of the specific sound and the typical background sound level ($L_{A90,T}$) in the absence of the specific sound.

The Standard advises that the time interval ('T') of the background sound measurement should be sufficient to obtain a representative or typical value of the background sound level at the time(s) the source in question operates or is proposed to operate in the future.

Comparing the rating level with the background sound level, BS 4142 states:

- "Typically, the greater this difference, the greater the magnitude of impact.

- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context."

4.0 ENVIRONMENTAL NOISE SURVEY

4.1 Survey Methodology

Monitoring of the prevailing background noise was undertaken over the following 24-hour period:

11:30 hours Tuesday 28th November to 12:30 hours Wednesday 29th November 2023.

As the survey was unattended it is not possible to comment with certainty regarding meteorological conditions throughout the entire survey period. However, based on observations during the site visits and weather reports for the area, conditions were generally considered suitable for obtaining representative noise measurements, being predominantly dry with little wind.

Measurements were made of the L_{A90}, L_{Amax} and L_{Aeq} noise levels over sample periods of 15 minutes.

4.2 Measurement Locations

To determine the existing noise climate at the site measurements were undertaken at the following locations:

Long Term Measurement Position 1 – West Façade of Site

The microphone was positioned on an A-Frame and positions out of a 1st floor window on the western façade of the site. This measurement location is considered representative of the worst affected area from the nearby plant associated with the adjacent commercial premises.

Short Term Measurement Position 2 and 3 – North and South Façades of Site

Additional short-term measurements were undertaken at the North and South facades of site for a duration of 15minutes during the daytime.

The measurement positions are also illustrated on the site plan attached in Figure 1 and the photos in Figures 2, 4 and 5 (Appendix C).

4.3 Instrumentation

For information regarding the equipment used for the measurements please refer to Appendix B.

The sound level meters were calibrated both prior to and on completion of the survey with no significant calibration drifts observed.

4.4 Long Term Measurement Results

The noise levels measured are shown as time-histories on the attached Graphs 1-2 (Appendix C).

The minimum L_{A90} and the period averaged L_{Aeq} noise levels measured are summarised in Table 2.

Table 2 – Long Term Measured Levels

Measurement Period	Minimum $L_{A90,15min}$ (dB)	L_{Aeq} (dB)
Daytime (07:00 – 23:00)	44	62
Night-time (23:00 – 07:00)	43	48

4.5 Short Term Measurement Results

The minimum L_{A90} and the period averaged L_{Aeq} noise levels measured for both short term positions summarise below in Table 3.

Table 3 – Short Term Measured Levels

Measurement Location	Minimum $L_{A90,15min}$ (dB)	$L_{Aeq,15min}$ (dB)
North Façade	57	59
South Facade	54	52

As can be seen from comparing the measured levels above, the L_{Aeq} noise levels at the North and South facades are lower than those measured during the daytime at the West façade. This is largely due to these facades being screened and therefore, less affected by the nearby plant associated with the adjacent commercial premises.

5.0 BRITISH STANDARD 4142:2014 ASSESSMENT

5.1 General

Noise from nearby plant associated with commercial properties adjacent to the development were noted whilst on site – most notably serving Origin Housing's offices.

In order to assess the level of impact from the plant, an assessment has been undertaken to offer an overall comparison when the plant is in operation and when the plant is off.

5.2 Criteria

As discussed within Section 3.3, BS4142:2014 *Methods for rating and assessing industrial and commercial sound* forms the basis of this assessment.

In contextualising the predicted noise level, the following table can be used to classify predicted noise levels against the likely risk of adverse impact.

Table 4 – Excess Level compared with Impact Level

Excess of rating level over background sound level dB	Description
<0	Likely to be an indication of low impact
>+5	Likely to be an indication of an adverse impact
>+10	Likely to be an indication of a significant adverse impact depending on the context

The standard does however make significant note regarding the importance of the context of the site in assessing the potential significance of any plant or commercial noise source. For example, Section 11 states:

> *The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs. An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context.*

In addition to the above and considering there are existing residential areas nearby, it is important to note the following guidance provided in Section 8.5 (Introduction of a new noise-sensitive receptor) in BS4142:2014:

> *"NOTE Where a new noise-sensitive receptor is introduced and there is extant industrial and/or commercial sound, it should be recognized that the industrial and/or commercial sound forms a component of the acoustic environment. In such circumstances other guidance and criteria in addition to or alternative to this standard can also inform the appropriateness of both introducing a new noise-sensitive receptor and the extent of required noise mitigation.*

Furthermore, Section 11 (Assessment of the impacts) highlights the importance of taking in all pertinent factors into consideration including:

"The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions, such as:

i) facade insulation treatment;
ii) ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and
iii) acoustic screening."

It is important to note the above guidance when determining the extent of any adverse impact on a new residential development and especially when existing residential properties are currently experiencing an equal or greater adverse impact.

5.3 Assessment Results of Current Levels

Table 5 below provides an initial assessment of the current levels at the development site with comparisons to the representative background noise level.

Table 5 – Excess Level compared with Impact Level

Time Period	Cumulative Rating Level at Worst-Affected Receptor (L_{Aeq}) dB	Representative Background Level (L_{A90}) dB	Exceedance of Rating Level over Background Level (dBA)	Description of Impact Level
Worst Case 1 hour period during Daytime (23:00 – 07:00)	68	44	+22	Likely to be a significant adverse impact depending on the context
Worst Case 15-minute period during Night-time (23:00 – 07:00)	56	42	+14	Likely to be a significant adverse impact depending on the context

5.4 Context / Discussion

As can be seen from the above, the impact level predicted by the BS4142 assessment for worst case periods suggests that both daytime and night-time activities are likely to have a significant adverse effect.

However, as acknowledged by BS4142, it is critical to give consideration to the context of these assessments. Firstly, the proposed development is located on a densely populated street, with numerous residential properties nearby which are also affected by the commercial sources measured. Additionally, it is evident that the plant does not operate (or operates at a low level) during the majority of the night-time period.

5.5 Mitigation Methods

Considering the above, we would recommend that mitigation measures are installed to all operating plant adjacent to the development in order to reduce the resultant noise level at the proposed development by a minimum of 22dBA. Potential mitigation measures are outlined below:

- Installation of acoustic enclosures to the existing condenser units on the adjacent façade. An example acoustic enclosure which achieves an overall reduction of 26dBA is provided in Figure 6 (Appendix C).

We understand the condenser units on the façade are serving Origin Housing's offices and therefore noise from these units will be appropriately attenuated by Origin Housing (subject to an appropriate planning condition attached to the prior approval).

Table 6 below provides the predicted noise levels at the development site once the necessary mitigation measures have been installed.

Table 6 – Resultant Level after mitigation compared with Impact Level

Time Period	Cumulative Rating Level at Worst-Affected Receptor (L_{Aeq}) dB after Mitigation	Representative Background Level (L_{A90}) dB	Exceedance of Rating Level over Background Level (dBA)	Description of Impact Level
Worst Case 1 hour period during Daytime (23:00 – 07:00)	42	44	0	Likely to be an indication of low impact
Worst Case 15-minute period during Night-time (23:00 – 07:00)	30	42	0	Likely to be an indication of low impact

As can be seen from the above, adoption of the mitigation measures proposed would ensure no exceedance of the background level and therefore no / low impact to the existing background level during both the daytime and night-time periods.

6.0 CONCLUSION

RBA Acoustics has been appointed to provide a noise impact assessment for the proposed conversion of 1A Polygon Road from an existing office building (Use Class E(g)(i)) to residential accommodation (Use Class C3).

Conversion of existing offices to residential accommodation is permitted under the Town and Country Planning (General Permitted Development) (England) Order 2015 ('the GPDO') without the need for a full planning application process. Notwithstanding this, however, the Applicant needs to consider the "impacts of noise from commercial premises on the intended occupiers of the development" in accordance with the requirements of Schedule 2 (Part 3), Class MA of the 2021 amendment to the GPDO.

In order to review the nature and impact of commercial sound sources affecting the application site, an environmental survey was undertaken during a typical 24-hour period at the worst affected façade / location in addition to short term measurements around the site. The measured levels have highlighted there is significant noise associated with nearby commercial properties and acoustic mitigation will be required to ensure appropriate levels at the application site. Outline mitigation measures have been proposed to ensure resultant noise at the development site has no adverse impact on future residents. Subject to an appropriate planning condition attached to the prior approval, the building services units will be appropriately attenuated by Origin Housing.

Appendix A – Acoustic Terminology

A-weighting (e.g. dB(A))	A correction applied across the frequency bands to take into account the response of the human ear, and therefore considered to be more representative of the sound levels people hear.
DeciBel (dB)	Unit used for many different acoustic parameters. It is the logarithmic ratio of the level being assessed to a standard reference level.
$L_{eq,T}$	The level of a notional steady sound which, over a stated period of time, T, would have the same acoustic energy as the fluctuating noise measured over that period. Typically used to represent the average or ambient noise level.
$L_{Aeq,T}$	The A-weighted level of a notional steady sound which, over a stated period of time, T, would have the same acoustic energy as the fluctuating noise measured over that period. Typically used to represent the average or ambient noise level.
L_{An} (e.g. L_{A10}, L_{A90})	The sound level exceeded for n% of the time. E.g. L_{A10} is the A-weighted level exceeded for 10% of the time and as such can be used to represent a typical maximum level. Similarly, L_{A90} is the level exceeded for 90% of the measurement period, and is often used to describe the underlying background noise.
$L_{Amax,T}$	The instantaneous maximum A-weighted sound pressure level which occurred during the measurement period, T. It is commonly used to measure the effect of very short duration bursts of noise, e.g. sudden bangs, shouts, car horns, emergency sirens etc. which audibly stand out from the ambient level.
Octave band	A frequency band in which the upper limit of the band is twice the frequency of the lower limit.
1/3 Octave band	A frequency band which is one-third of an octave band.
R_w	A single number quantity which characterises the airborne sound insulation of a material or building element in a laboratory test.

Appendix B – Instrumentation

The following equipment was used for the measurements.

Table B1 – Equipment Calibration Details

Manufacturer	Model Type	Serial No.	Calibration	
			Certificate No.	Expiry Date
Norsonic Type 1 Sound Level Meter	Nor140	1406116	U42827	22 December 2024
Norsonic Pre Amplifier	1209	20295		
Norsonic ½“ Microphone	1225	344468	42826	22 December 2024
Norsonic Type 1 Sound Level Meter	Nor140	1406258	U43972	31 March 2025
Norsonic Pre Amplifier	1209	20490		
Norsonic ½“ Microphone	1225	168249	43871	31 March 2025
Norsonic Sound Calibrator	1251	34397	U43870	30 March 2025

Appendix C – Site Plans

1A Polygon Road, London

L_{Aeq} Time History

Measurement Position 1 (West Façade), Tuesday 28th to Wednesday 29th November 2023

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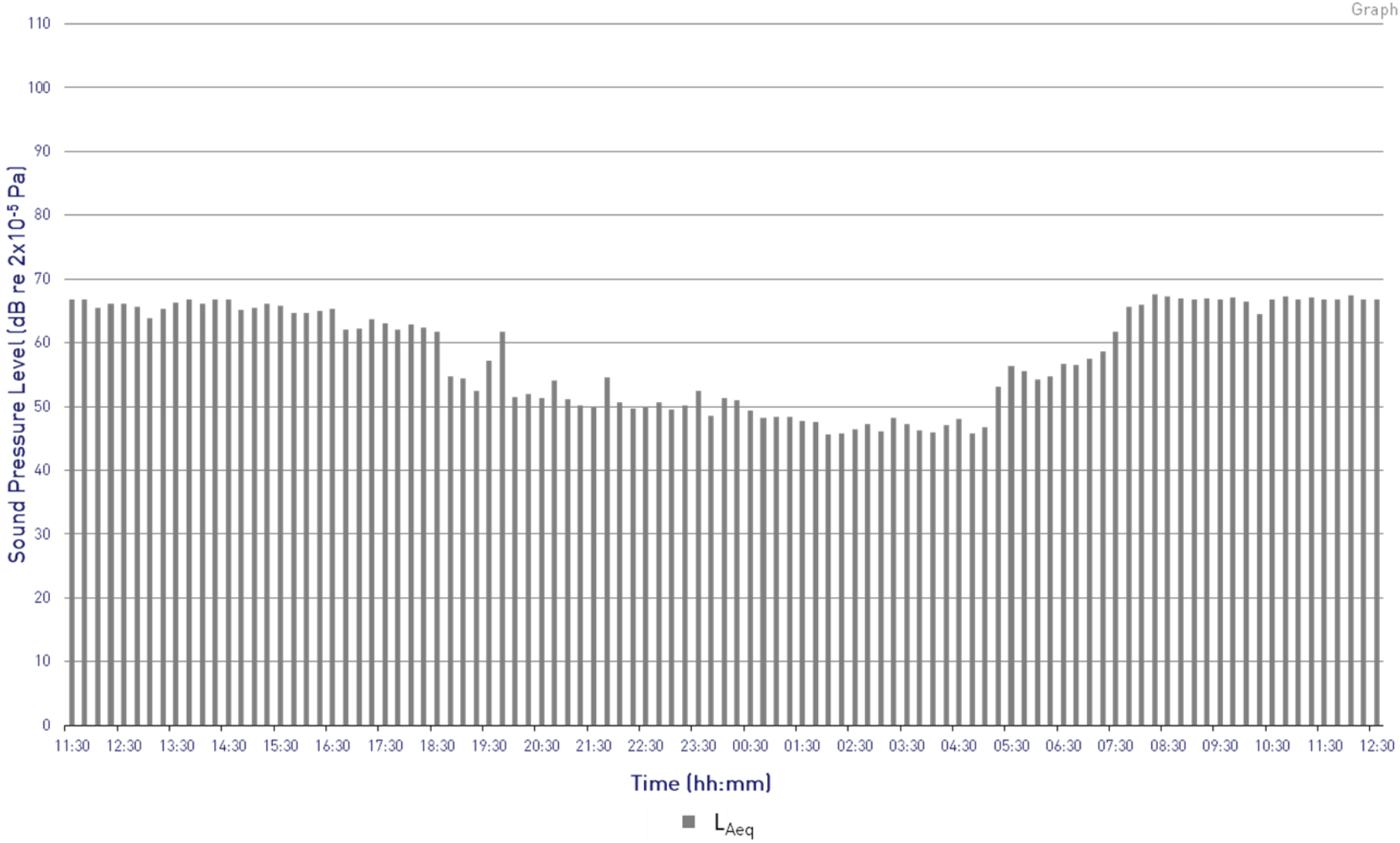
Graph 1



1A Polygon Road, London

$L_{Amax,f}$ and L_{A90} Time History

Measurement Position 1 (West Façade), Tuesday 28th to Wednesday 29th November 2023

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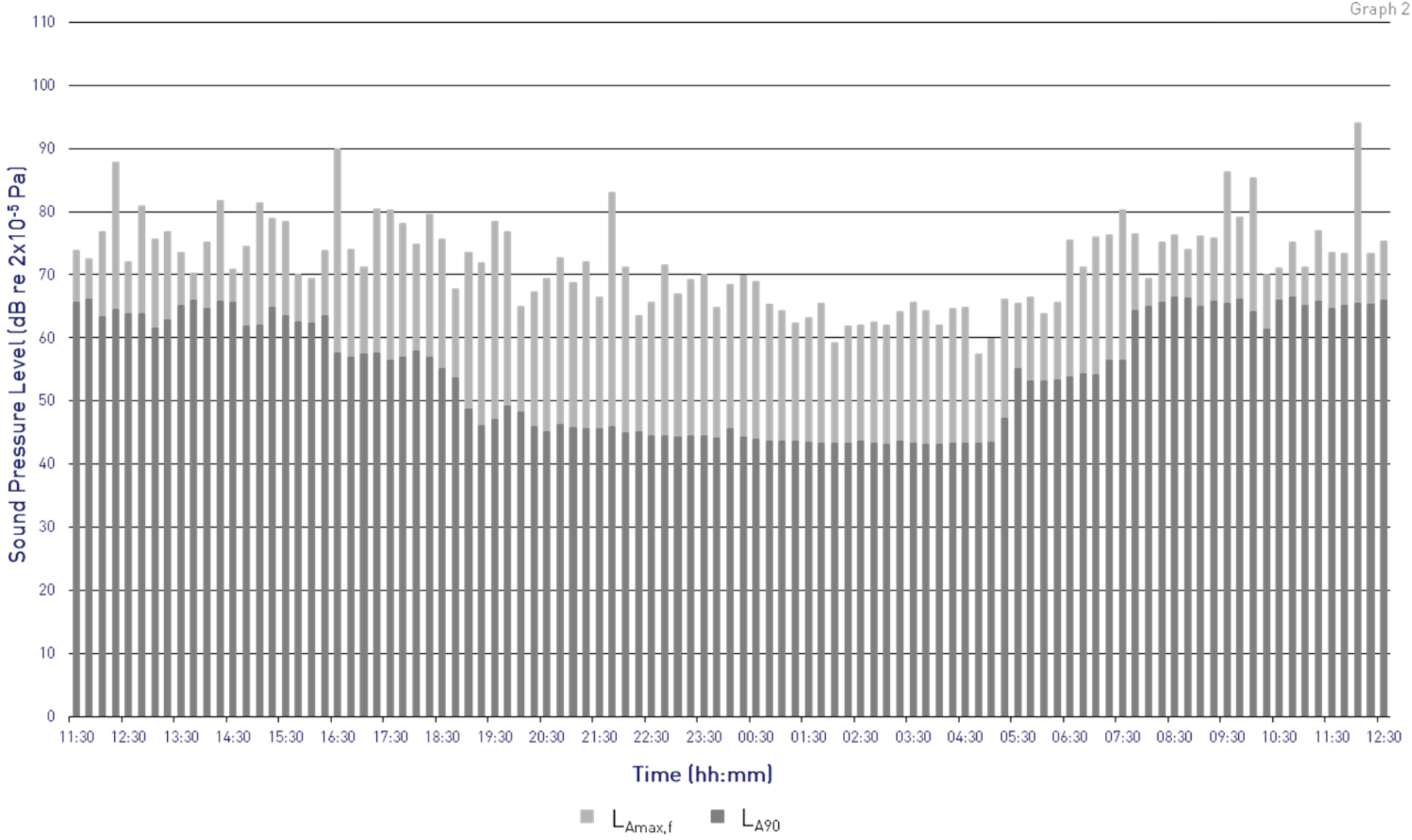
Graph 2



1A Polygon Road, London NW1

Site Plan

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Figure 1

22 December 2023

Not to Scale

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1A Polygon Road, London NW1

Photograph Showing Measurement Position 1

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Figure 2

22 December 2023

Not to Scale

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Photograph Showing Plant Adjacent

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Figure 3

22 December 2023

Not to Scale

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Photograph Showing Measurement Position 2

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Figure 4

22 December 2023

Not to Scale

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1A Polygon Road, London NW1

Photograph Showing Measurement Position 3

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Figure 5

22 December 2023

Not to Scale

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environlite ELV1.1.25AC Acoustic Performance Data (March 2010)

Noise Measurement Information:

Test: Environ Lite Acoustic Enclosure — W 1700mm x D 1000mm x H 1550mm

Test Standard:

BS EN ISO 140-3 Acoustics - Measurement of Sound Insulation in Buildings and of Building Elements - Part 1: Airborne Sound Insulation

Sound Level Measuring Equipment:

Norsonic 830 RTA Precision Sound Analyser Type 1
CEL 284/2 Acoustic Calibrator Type 1
JBL Loudspeaker driven by CEL Loudspeaker driven by 830 White Noise Source

Transmission Loss Data:

Transmission Loss — Environ ELV1.1.25AC Acoustic Enclosure							
Octave Frequency in Hertz (dB ref 2 x 10^{-5} Pascal's)							
63	**125**	**250**	**500**	**1K**	**2K**	**4K**	**8K**
14	16	23	30	37	39	38	39
Summary							
Transmission Loss Equates to an Overall Reduction of 26 dB(A)							

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